

A VIRTUAL COLLABORATIVE WEB ENVIRONMENT FOR MARS SURFACE SCIENCE STUDIES

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INTRODUCTION: A virtual collaborative web environment is now available for the planetary community to better utilize, visualize, and analyze Mars Global Surveyor data. These tools have grown out of a 2 year effort by the Center for Mars Exploration (CMEX) at NASA Ames Research Center (ARC), the Ames data visualization group, and the Mars Surveyor Program to promote interactions among the planetary community to coordinate landing site activities.

In collaboration with information technologists at Ames, CMEX is developing this state-of-the-art web site environment to foster interaction of interested members of the planetary communities with the Mars Surveyor Program. This web site will continue to evolve over the next several years as new tools and features are added to support the ongoing Mars missions and the analyses of the returned data.

WEB SITE FEATURES: A variety of tools have been developed and are accessible at the Ames Mars Surveyor Landing Site Studies web page <http://marsoweb.nas.nasa.gov/landingsites/>. Recently added tools include: (1) online JAVA-based image processing of MOC images for users of the Internet Explorer browser, (2) on-the-fly creation of zoomable, rotatable 3D perspective image views (VRML's) of any location on Mars, incorporating all available MOC and MOLA data, and (3) an information window that gives the latitude, longitude, and elevation at a given point as the user moves the cursor along MOLA profile superimposed on MOC images.

Additional tools include: (1) a clickable, zoomable Map Interface from which web pages for all candidate Mars Surveyor landing

sites can be accessed, (2) the entire collection of released high-resolution MOC images with annotated Viking context images, (3) low- and high-resolution zoomable, rotatable 3D image views of all proposed Mars Surveyor landing sites--these VRML's include geologic map overlays and embedded MOC and MOLA data where available, (4) a downloadable macro that allows both Windows and Macintosh users to import MOC images in PDS format directly into the popular NIH Image and Scion Image shareware programs, and (5) a Postdoctoral Mars Surveyor Landing Site Studies group. Postdoc users can propose a landing site, submit both science and engineering evaluations, post supporting image, graphics or word documents of their proposed landing site(s), or create their own email subgroup list for their respective landing sites.

PLANNED ENHANCEMENTS: Future enhancements to the web site include integration of geologic (from USGS maps or user supplied) and mineralogic (from TES released data) maps composited with surface images and as overlays on 3D VRML terrains. We also plan to integrate rock abundance, and thermal inertia data. Other enhancements include the use of Concept Maps as a user interface for links to relevant site data (e.g. abstracts, science evaluations, images, maps, and online reference materials). The goal is to allow users and peer reviewers to create and edit Concept Maps in a collaborative fashion.

New Java-based application tools for analyzing and visualizing MGS data are also planned. For the first time this will allow Macintosh users the ability to read and work with MGS TES data, since a Macintosh appli-

cation program is currently unavailable. Other web-based applications will allow users to easily locate and work with available MOLA data of their sites. For example, from within the 3-D image models, users will also be able to move their cursor over the MOLA profile to find out the latitude, longitude, and elevation of any given point along the profile.

Collaborative tools will be enhanced to include collaborative whiteboards, collaborative image viewing and annotation, and support for possible Usenet news groups, chat rooms, and/or list-serve mailing lists. Some of these capabilities are already provided on Postdoc, which allows user-uploadable and retrievable materials and threaded mail archives.

CONCLUSION: This website is intended to be an integrated repository for the latest Mars mission images, data, and data products that pertain to landing site selection and Mars surface science studies. This site provides user-friendly visualization and data analysis tools including on-the-fly image retrieval, automosaicking, and VRML creation, with options to include surface context images, topographic profiles, geologic and surface composition maps, and other relevant data. We encourage the planetary community to make use of this resource not only for landing site studies but also for general Mars surface science studies. We welcome suggestions for enhancing and improving this site.